2019 Illinois Summer Preparedness Policy Session

June 26th, 2019

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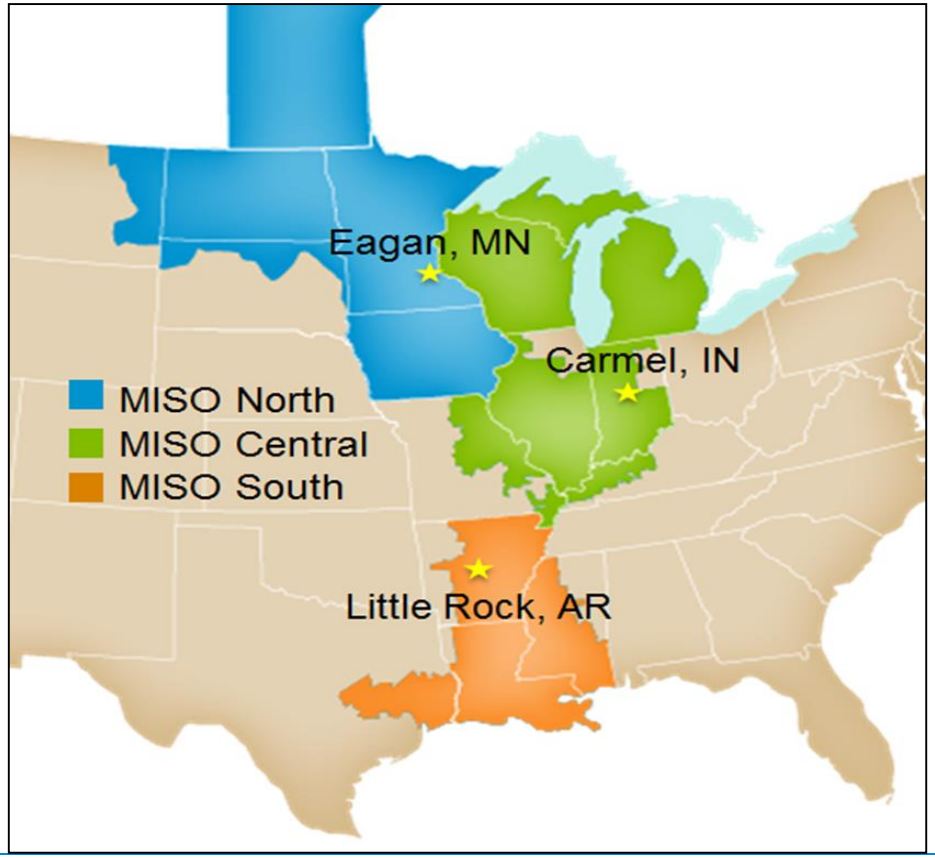
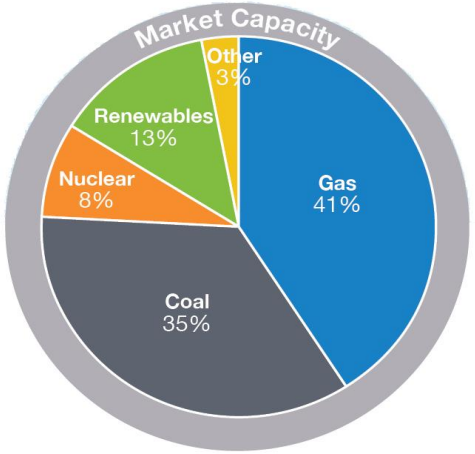
MISO drives value creation through efficient and reliable markets, operations, planning, and innovation

The most reliable, value-creating RTO

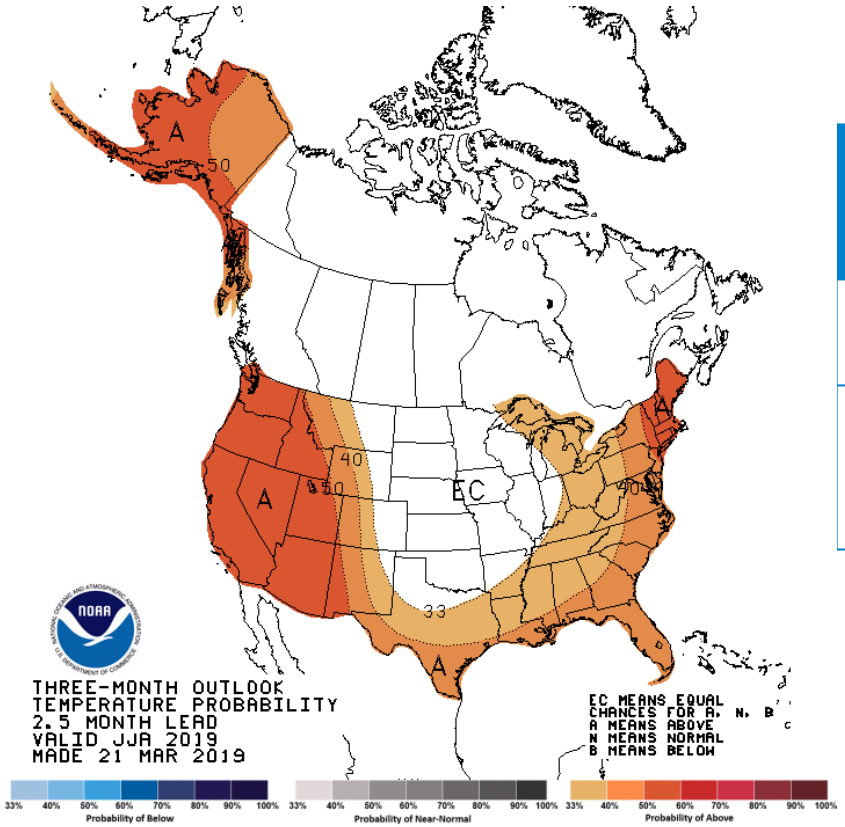


MISO by-the-numbers	
High Voltage Transmission	65,800 miles
Generation Capacity	174,678 MW
Peak Summer System Demand	127,125 MW
Customers Served	42 Million



https://www.misoenergy.org/about/media-center/corporate-fact-sheet/

149 GW of resources available to cover demand and outages for Summer 2019



MISO Preliminary 2019 Summer Forecast	
Summer Peak Forecast	125 GW
Total Projected Available Capacity*	149 GW

All-time Summer Peak:
127 GW on July 20th, 2011

NOAA forecasts warmer than normal temperatures for the MISO South region and parts of the Eastern footprint

*Includes Installed Capacity of Planning Resource Auction cleared resources, with wind and solar at capacity credit, plus Planning Resource Auction offered generation that did not clear but is expected to be available for the summer season

MISO projects adequate reserves to meet 2019 expected summer peak demand forecast

- However, summer scenarios with high resource outages and high demand could have some challenges

	Demand Forecast (GW)	Reserve Margin Requirement (GW)	Supply (GW)	Reserves (GW)	Minimum Reserve Requirement	Beyond Requirement
2017/18 PY	125.0	144.8	148.5	23.5 (18.8%)	15.8%	3.0%
2018/19 PY	124.7	146.0	148.6	23.8 (19.1%)	17.1%	2.0%
2019/20 PY	124.7	145.9	148.8	24.1 (19.3%)	16.8%	2.5%

Range of projections include the uncertainty of a number of parameters and incorporate lessons learned from past years

Generation

- **Probable Generation Capacity**
  - Removes an average volume of resource outages (planned, maintenance, and forced)
- **Low Generation Capacity (High Outage)**
  - Removes a higher than normal volume[1] of resource outages (planned, maintenance, and forced), typically because of non-normal weather conditions

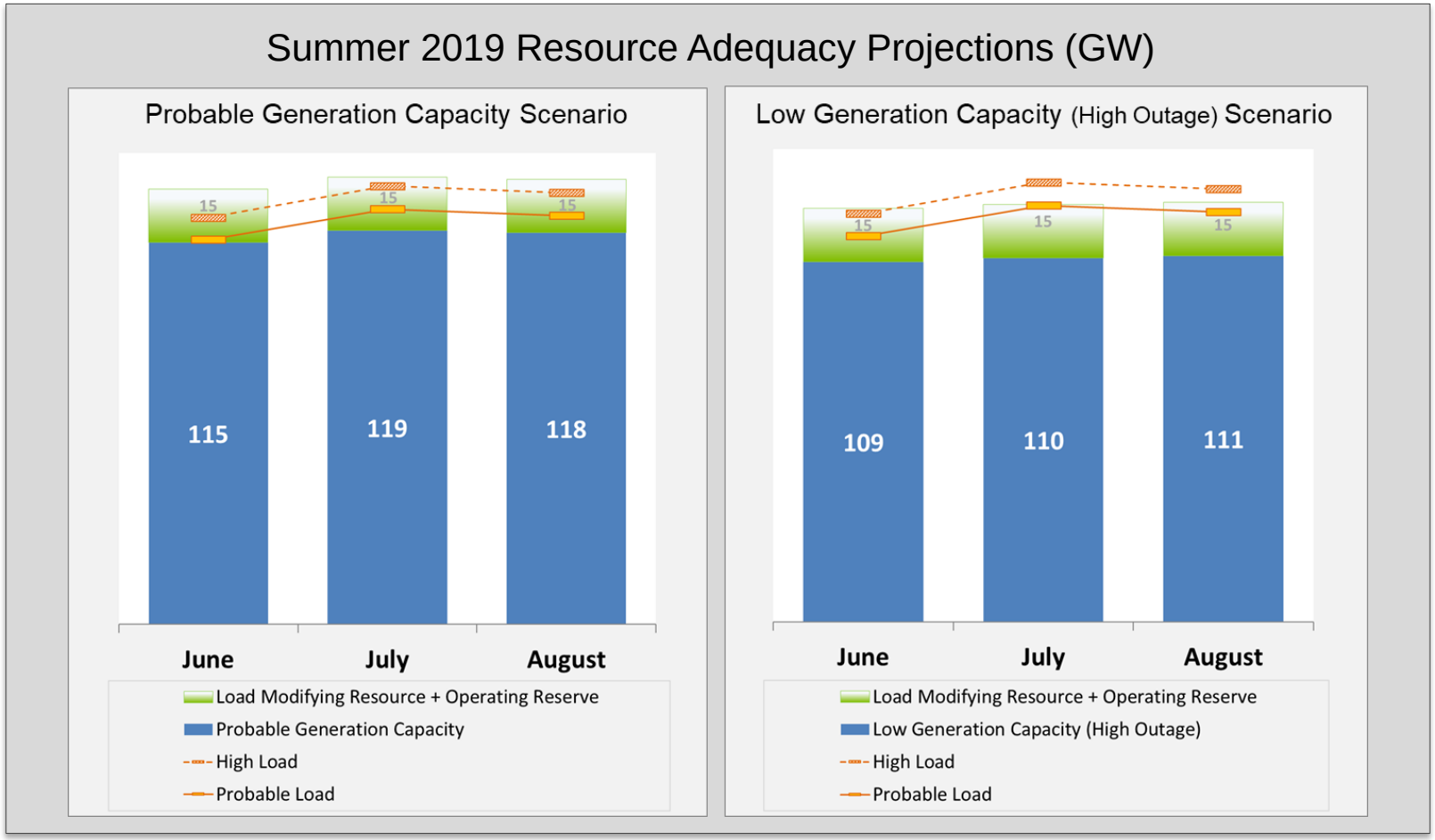
Load

- **Probable Load Forecast**
  - 50/50 forecast,[2] provided by Market Participants
- **High Load Forecast**
  - 90/10 forecast [3]

[1] Based on 5-year historical outage information provided by Resource Owners
[2] 50% chance of the actual load being lower and 50% chance of the actual load being higher
[3] 90% of the actual load being lower and 10% chance of the actual load being higher

Adequate reserves are projected to meet expected summer peak demand forecast

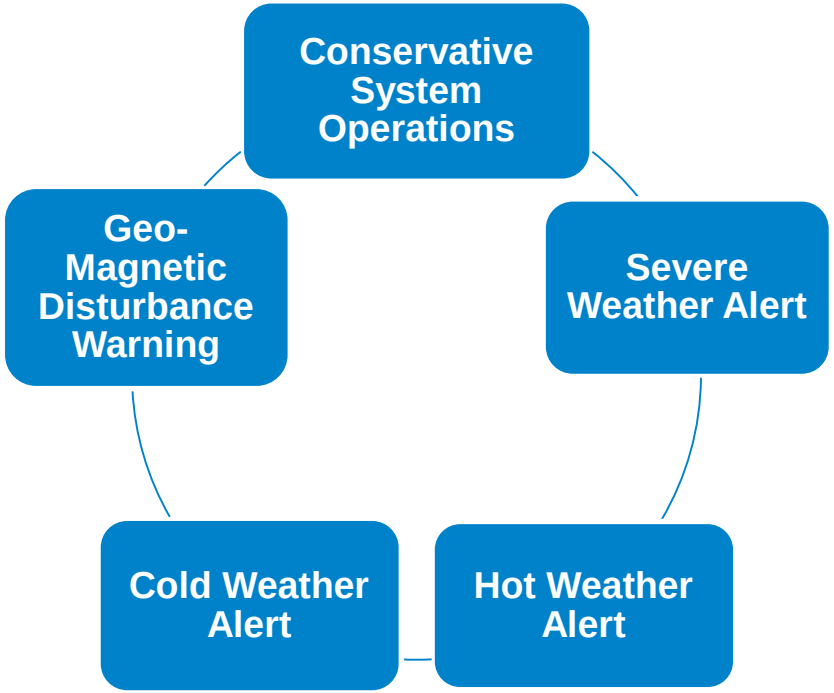
Summer scenarios with high generation outages and high demand could drive operational challenges



MISO partners with members, drills on emergency procedures, and builds on past lessons learned to ensure operational readiness for summer.

Emergency Operating Procedures

guide operator actions when an event has the potential to, or actually does, negatively impact system reliability



Maximum Generation Emergency Procedures

Capacity Advisory	• Advance notice of forecasted capacity shortage, requests Stakeholders update offer data	
Alert	• Define boundaries/suspend maintenance	
Warning	• Schedule in External Resources, Curtail export transactions, Reconfiguration, and set Emergency Pricing Tier 1 Offer Floor	Emergency Pricing Tier 1 Offer Floor
Step 1	• Commit Emergency Resources, Declare NERC EEA 1, Activate Emergency Limits	
Step 2	• Declare NERC EEA 2, Implement LMRs, LMMs Stage 1, Commit EDR Resources, Emergency Energy Purchases, Public Appeals, and set Emergency Pricing Tier 2 Offer Floor	
Step 3	• Utilize Operating Reserves, and LMMs Stage 2	Emergency Pricing Tier 2 Offer Floor
Step 4	• Reserve Call and Emergency Reserve Purchases	
Step 5	• Declare NERC EEA 3, Firm Load Shed, and set LMPs and MCPs to the VOLL	
Termination	• Max Gen and, possibly, Capacity Advisory Termination	

Data Source: SO-P-NOP-00-449 Rev 2 Conservative System Operations and SO-P-EOP-00-002 Rev 7 MISO Market Capacity Emergency procedures

Stakeholder awareness of emergency procedures and communication processes improves transparency and sets expectations, ensuring the integrity of the electric grid

MISO initiates several types of communications ahead of, or during abnormal operating conditions

1. **Capacity Emergencies** requiring firm load curtailments
2. **Transmission System Emergencies or Forced Transmission Outages** requiring firm load curtailments
3. **Severe risk of terrorist attack, man-made or natural disasters** with potential to cause loss of firm load

Contact Info

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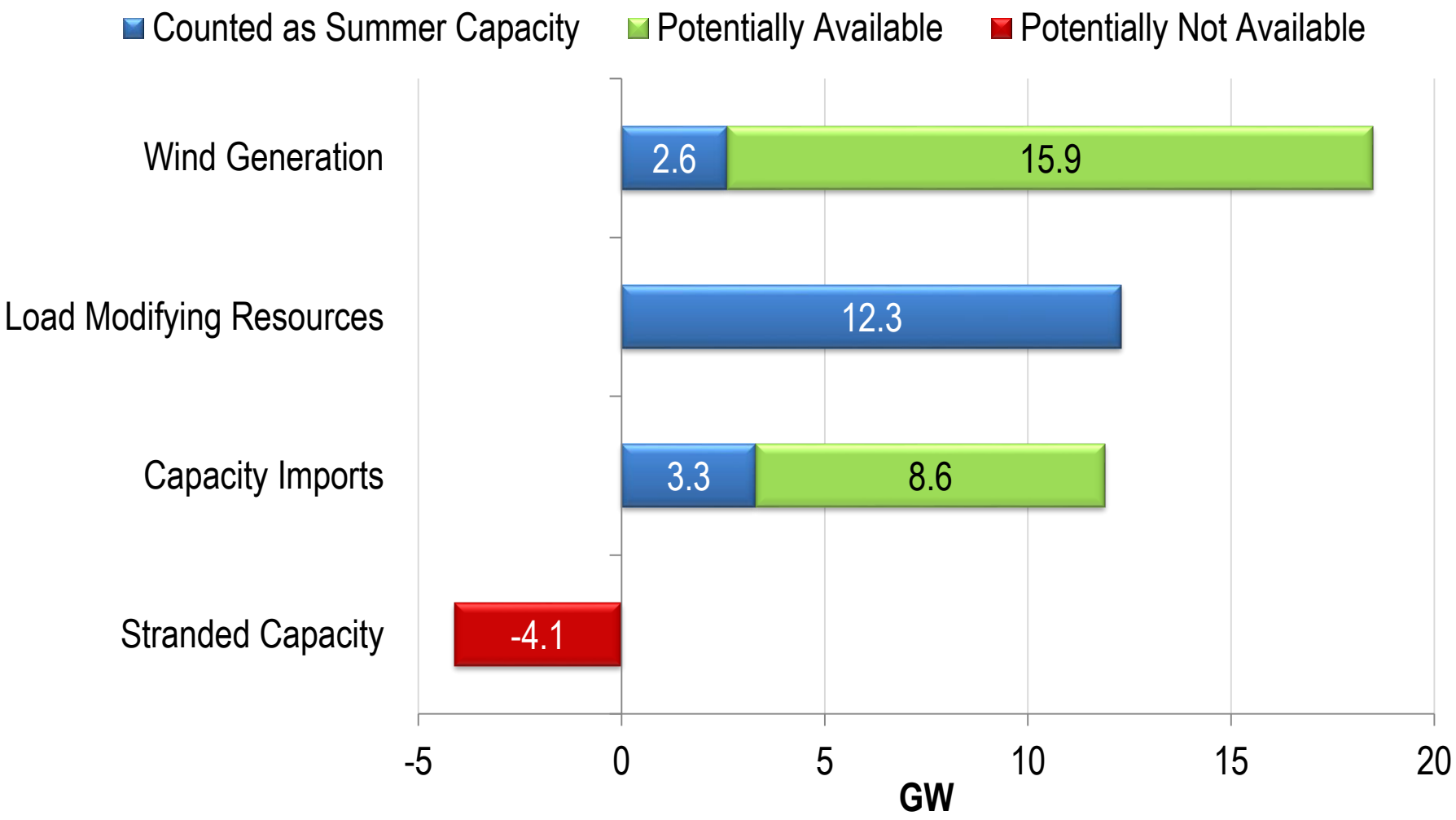
Questions?

Appendix

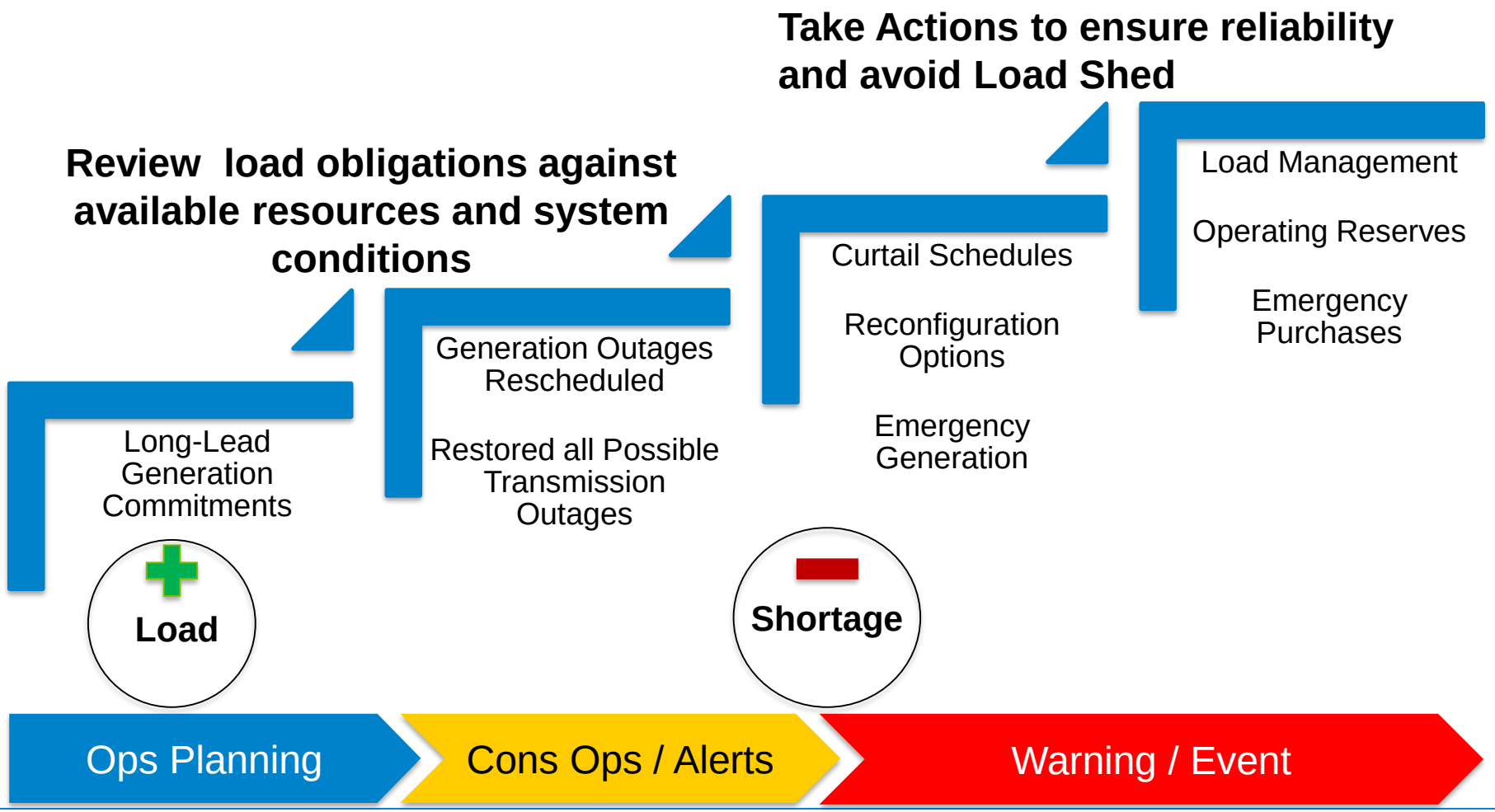
MISO is well prepared to handle operational challenges this summer

- MISO projects adequate reserve to meet 2019 summer peak forecasted demand of 125 GW
- No identified issues with the transmission system
- MISO engages with its state officials and stakeholders to maximize preparation during emergency conditions
- MISO partners with members and neighbors to ensure operational readiness for summer

The need for emergency procedures will be impacted by the availability of resources



MISO prepares for extreme conditions in advance. In Real-Time, unplanned outages and other unknowns may require additional actions



MISO is prepared for emergency situations